v.15 #10

The MONTHLY REVIEW

Published Monthly by the

American Electroplaters Society

A SOCIETY FOR THE ADVANCEMENT

OF THE

SCIENCE OF ELECTROPLATING

OCTOBER, 1928

Entered as second-class matter, September 8, 1926, at the Post Office of Chicago, Ill., under act of August 24, 1912.

Acceptance for mailing at special rate of postage, provided for in section 1103, Act of February 28, 1925, authorized September 8, 1926.

EXECUTIVE BOARD AND OFFICERS, 1928-1929

President

Horace H. Smith.....Member Newark Branch
208 N. Third St., Newark, N. J.

First Vice-President

C. E. VanDerau.....Member Dayton Branch
Care Westinghouse Products Co., Mansfield, Ohio

Second Vice-President

Wm. J. R. Kennedy.....Member Hartford, Conn., Valley Branch
Springfield, Mass.

Secretary-Treasurer

George Gehling.....Member Phila. Branch
5001 Edmund St., Philadelphia, Pa.

Editor

F. J. Hanlon.....Member Chicago Branch
3040 Diversey Ave., Chicago, Ill.

John H. Feeley.....Past Pres., Member Montreal Branch
411 Ayemer St.

Associate Editors

Dr. Wm. Blum, Bureau of Standards, Washington, D. C.
Past Pres., W. S. Barrows, Toronto Branch
Past Pres., O. E. Servis, Chicago Branch
Past Editor and Pres., H. H. Williams, St. Louis Branch
Past Editor, H. E. Willmore, Chicago Branch
E. Lamoureaux, Chicago Branch

Index-Contents Issue

	Page
President's Message	3
Paper by Jos. Triska, New York Branch	4-5
Paper by J. J. Bloomfield and Dr. Wm. Blum	5-7
Paper by David Ayers, Toronto Branch	7-17
Address by Mrs. Bertha Bast	17-18
Philadelphia Branch Chemistry Class Doings	18-21
Branch Reports	21-30
A. E. S. Page	22
Elections and Directory	31-32

MONTHLY REVIEW

Published by the

American Electroplaters Society

Publication and Editorial Office

3040 Diversey Ave., Chicago

VOL. XV OCTOBER, 1928 No. 10

EDITORIAL

NOTICE FROM OFFICE OF PRESIDENT

In all the years the Society has been in existence there has been no work done on any one subject by all the Branch Societies. It has been my wish to see the Society make definite progress along some certain line of our work. If all the Branches would discuss at least at one of their meetings the same subject and send the results of the discussion to a clearing house where it would be assembled and then presented to the whole membership, much good could be accomplished. There is a vast amount of real information in each Branch waiting to be assembled in some manner that would be helpful to every member. Let the whole membership be a research committee, experiment along some definite line, collect notes and then discuss the results at meetings. Have this discussion reviewed by other Branches. That would be a way to settle some method of plating or create some real plating solution.

I have asked Oliver J. Sizelove and George B. Hogaboom to work out a plan to put into practice my views.

Your secretary will receive a letter from them outlining a plan. I would be pleased to have all the members join in making this idea a success and am going to count on every one of you to support all the ability you possess. I can only plan to build up the Society—upon you I can depend to cooperate. If all work together the results as reported at the Detroit Convention will prove that it is worth while to "know a little about everything, but everything about one thing."

Horace H. Smith, President.

SWISS BLACK ON IRON AND STEEL

(Translated from the German by E. Schor)

Jos. Trisko, New York Branch

In this article I shall describe my experience with rust proof black which is used in Switzerland on watch cases, cigarette cases, gun barrels, etc. It must undergo six operations in order to make it successful. First of all, Ferros Oxide (Fe O) must be applied to the iron or steel in a nice, even, thick coat. The oxide tincture is made in the following manner:

Water	3 pints
Nitric acid 40 Be'	1 oz.
Hydrochloric acid 20 Bé	¼ oz.
Copper sulphate	¼ oz.
Chloride of iron dry ($FeCL_3$)	7 oz.

This tincture solution should read 10 Be' on the Hydrometer. The tincture should be kept in a dark bottle with an airtight stopper.

To use, put 7 fluid oz. of tincture in a porcelain dish. Any tincture which remains must be thrown away. The iron articles are first polished and cleaned as for plating. If a dull finish is desired the iron or steel should be sand blasted or satin finished according to the shade desired.

Operation 1.—Apply a nice even coating with a sponge. Care should be taken that the sponge is thoroughly squeezed out before it is applied to the work. The article will at once take a light copper color. After this let the work dry in the air for half an hour or until a green oxide appears on the article.

Operation 2.—Take the article and put it into a hot iron plate 100 C. heat for ¼ of an hour or until the article turns brown. It forms Oxide of Iron (Fe_2O_3).

Operation 3.—Hang the articles on a copper wire and put them into a closed iron box, on the bottom of which is a pan of water. After 15 minutes there will appear on the articles a coating of moisture like that of dew. The better the moisture the better the oxide will form on the articles.

Operation 4.—The articles are now placed in copper or iron baskets and kept in boiling water for ½ hour, about this time the rust coating has changed its nature and appears as black oxide of iron (FeO).

Operation 5.—The articles are withdrawn from the boiling water and dried. They are then scratch-brushed with a soft cir-

cular steel wire brush rotating about 800 r.p.m. The operator must be careful to have his hands clean so as not to leave any stains on the work. To get a good proof black the first five operations must be done over twice.

Operation 6.—After the final scratch-brushing the articles are boiled in linseed oil for ½ hour. They are then taken out and then dried with rags. The articles will now appear with a nice black coat according to the preparation of the work. This is the genuine Swiss process with which I worked in Zurich, Switzerland.

HEALTH HAZARDS IN CHROMIUM PLATING[1]

By J. J. Bloomfield[2] and W. Blum[3]

I—Introduction

In connection with the rapid extension of chromium plating during the past few years, numerous reports have been received regarding injuries to the health of the operators. In order to obtain information regarding the cause and extent of such hazards and the best methods of preventing or alleviating them, a brief joint investigation was made by the Public Health Service and the Bureau of Standards. This study included (a) a compilation of the information available in the literature regarding the effects of chromium compounds on health, (b) the measurement of the conditions of ventilation in six chromium plating plants, and (c) the physical examination of twenty-three workers in these plants. The results may be summarized as follows.

II—Effects of Chromium Compounds on Health

It has been known for over a century that persons engaged in the manufacture of dichromates (which are very similar in properties to chromic acid) are likely to develop ulcers or "chrome holes" on their hands and arms, and on the septum of the nose. In the latter location the attack of the tissue is likely to continue till the nasal septum is actually perforated. In one English dichromate plant in 1902 over 70 per cent of the workers had perforation of the septum, although many of them were unaware of the fact. There is however no conclusive record of any injury by chromates or chromic acid to the lungs, kidneys, or parts of the system other than the skin or nasal septum.

---

[1]This paper is an abstract of a paper published in Public Health Reports, Vol. 43, p. 2330, Sept. 7, 1928. Reprints of the original article may be obtained upon request addressed to the Bureau of Standards.

[2]United States Public Health Service.

[3]United States Bureau of Standards.

III—Ventilating Conditions

In most plants provision has been made for drawing off the spray of chromic acid that is carried into the air by the hydrogen and oxygen that are liberated at the cathode and anode respectively. The most effective method of ventilation is by drawing a rapid stream of air horizontally across the top of the plating solution and into a narrow slot or duct in the ventilating flue. In each plant that was studied the velocity of the air entering the duct was measured, and the concentration of chromic acid then present in the air above the tank at about the position of an operator's nose, was determined. The results showed that under otherwise favorable conditions, if the air has a velocity at the duct, of from 1500 to 2000 feet per minute, the concentration of chromic acid in the air is reduced to less than one milligram in ten cubic meters, or one-sixtieth of a grain in 350 cubic feet (which is about the volume of air breathed by a worker in eight hours). To ventilate effectively, the air should not be drawn a greater distance across the tank than about eighteen inches. For wider tanks, therefore, ducts should be provided on both sides, or a double duct in the center. It is advisable to keep the level of the plating solution at least eight inches below the top of the tank. Care should be taken to prevent anode hangers or racks from obstructing the air current to the duct. A hood surrounding the tank is advantageous in cutting off counter currents of air from open windows or other fans. It is not desirable, however, to apply suction at the top of the hood, as this counteracts the suction at the duct. The flues and fan blades should be made of sheet iron or steel, which is not appreciably attacked by chromic acid. The outside of the flues should be painted, e. g., with an asphaltic acid resisting paint, to prevent its corrosion by the steam and fumes in the room.

IV—Effects Upon the Workers

It was found that continuous exposure to concentrations of chromic acid slightly above one milligram in ten cubic meters may cause nose bleed and inflammation; and higher concentrations cause ulceration and perforation. Of the nineteen persons examined who were connected with chromium plating, all but two showed some injury to the nose, and three had perforated nasal septa. The latter group included one person who was racking articles about ten feet away from the chromium tank. Attack of the nasal tissues can be prevented or at least retarded by the

application of vaseline or metholatum salve several times a day.

To prevent injury to exposed portions of the skin by contact with chromic acid, rubber gloves, aprons, and boots should be worn if feasible. If gloves are not used the hands should be frequently washed with water; and a mixture of three parts of vaseline and one of lanolin applied to all open cuts or sores. Periodic medical inspection should be provided, and the slightest skin or nose affections should be treated. Such treatment should include washing with a reducing agent such as solutions of bisulfite, thiosulfate, or ammonium polysulfide; and the application of an ointment and a water-proof covering.

V—Conclusion

The results show that there is a real but not critical hazard in chromium plating. This hazard can be reduced and practically eliminated by adequate ventilation and proper sanitary measures. If suitable precautions are taken, there is no good reason why this hazard should hinder the extension of chromium plating.

PAPER BY MR. DAVID AYERS

Mr. David Ayers, member of Toronto Branch: "The Mechanical Plating Barrel. If memory serves us rightly we believe it was about 1897 that we were called upon to operate the first horizontal plating barrel, a product of the H. V. W. Co. of Newark, N. J., and you may well believe there was considerable speculation as to its efficiency. However, this machine soon proved its value when compared with the old method of plating stove bolts and small screws, namely, in wire baskets and perforated pans.

"What the mechanical plating barrel has done since that time for the electroplaters' industry it would be hard to estimate. During the last eight or ten years quite a number of automatic plating devices have been put on the market, and while some of these may be highly efficient in a number of cases it is our humble opinion that up to the present time at least there is nothing to take the place of the mechanical plating barrel, it has a duty to perform peculiar to itself.

"If it were possible in some manner to recall or cease the operation of every mechanical plating barrel in use at the present time we might be able to determine to a certain degree the value of these machines to our industry. But like every good and faithful servant these machines have their limit, they are economically

adapted to certain classes of goods but we believe at times they are put to severe tests, there are quite a large number of comparatively small articles to which they are entirely unadapted and as it is our intention this morning to try to indicate a few of these, we will pass on and try in a general way to illustrate what we mean.

"Class of Work Adapted to Barrel Plating. We present here today for your inspection a number of articles which have been brass plated in the horizontal plating barrels.

"We will select from these a number of certain pole ends which we believe represent on account of their round formation and the metal of which they are composed 'decarbonized or cold rolled steel' to be one of the best adapted articles to be plated in this manner.

"These pole ends are composed of two parts, originally we plated them separately but we encountered several bad features with this method. The first was that they would nest or pack together in the plating barrel and consequently a great number of them would receive nothing but a red or copper deposit, and these would have to be sorted and plated over again.

"Another objectionable feature about this method was that these parts required assembling to form this pole and this operation being done in the press room, meant a certain amount of handling and consequently the parts would become more or less soiled.

"We finally concluded to have the parts assembled before plating them and have continued to do so for the past five years with good results. Of course, this meant a different method of cleaning, but we will take that up later.

"Now we have here a nickel plated shoe horn, an article we have selected which on account of its shape and general formation presents, we believe, very nearly the opposite to these round pole ends we have before us. When we first received these shoe horns to nickel plate we concluded to try them out in the plating barrel and the result was not very encouraging.

"These shoe horns are composed of indentically the same metal as the pole ends, 'decarbonized steel,' when they come to the plating department the edges are very sharp which would be a decided objection if not removed.

"Now, before plating these parts we burnish them in a steel ball mill, this operation almost eliminates the sharp edge and at

the same time gives the surface a good finish before plating. Now they are ready for the cleaning operation which, of course, must be as speedy as possible. We have the choice of two methods, the tumbling barrel with enough hot cleaning solution to cover them, or to put the batch in a perforated pail and hang in the electric cleaner.

"The objection to the first method is that while revolving in the tumbling barrel the surface becomes slightly marred or checked; this we found was further aggravated in the plating barrel, the final burnishing operation failed to entirely eliminate this defect, we therefore concluded to rack and plate them in a still plating tank, and we here give the results as we found them.

"Each rack was constructed to carry one-half gross. The bath is large enough to carry eight of these racks which means that we get four gross in a batch.

"The time required to get what we believe to be a fairly good deposit for this class of goods is from twenty to twenty-five minutes. The cleaning and plating operations in no way injure the surface of these parts. Another feature in favor of this method is that we found that the most we could get from the plating barrel was 3½/2 gross, time of plating operation thirty to forty minutes, so that here we find a favorable margin in favor of the racking and plating of these parts in the still plating bath, in both cases they were burnished after plating. Now these facts in no way detract from the value of the mechanical plating barrel as an economical factor in the plating department.

"We have a number of other parts before us which we plate with good results in the plating barrels.

"Actual Operation of Plating Barrel. There are a few facts in regard to the operation of these plating barrels that we have followed with success, and possibly the majority of platers would consider the content of the solution one of the most important.

"This question of selecting a formula for a brass solution is a very broad one, there are so many different metals which the plater receives to be brass plated that it is only reasonable to conclude that it is up to the plater himself what formula is best adapted to his own particular needs. But it is our conviction that with very few exceptions the most simple formula is the best, we will give here the one used to obtain the results before us, this solution is operated cold.

"One lb. sodium cyanide, 8 oz. copper cyanide, 4 oz. zinc

cyanide, 2½ oz. soda ash, ¼ oz. ammonia chloride, 1 gallon water. This is a proportion of 2 of C to 1 of zinc.

"This will give a density of 17 or 18 Baume, which should be diluted to 14 or 15 Baume and with the general additions at stated intervals to offset dragout and evaporation, and occasional small quantities of a brightener composed of ½ lb. white arsenic dissolved with 1 lb. caustic soda to 1 gallon of water, boiled until clear.

"This brass solution we have found to be easily controlled. The proportions in the formula as here given are intended for barrel plating and can easily be diluted with water for use in the still plating bath.

"Now, in regard to the solution necessary to make these additions we find in barrel plating the zinc content can be diminished slightly.

"In the majority of formulas given for brass solutions the proportions are generally two or sometimes three parts copper to one of zinc; if the solution is to be operated in a mechanical plating barrel we would advise the proportion of two parts copper to one of zinc; if after operating the solution for a time it goes slightly off color when making the additions for loss either by dragout or evaporation, decrease the zinc content and increase the copper content in a like manner.

"We are operating at the present time two still plating baths of about 250 gallons each and while no accurate record has been kept still we believe we can safely state that we have not added more than two or three pounds of zinc cyanide to each one of the solutions during the past five years. But in the operation of the barrel platers we find we have to adhere more closely to the original proportions when making the usual additions, and while we believe that the agitation of the solution in the barrel plater is partly responsible for this difference, still we would like to hear some discussion on this point.

"As we all know, brass is an alloy of copper and zinc, and while we may know the proportions of the two metals, in the anodes we hang in the solutions and also the proportions we use in mixing that solution, and we proceed to operate the said solution for any length of time, and while we may be able to determine by various ways the amount of metal received at the cathode, we have no way of telling what proportion of either metal is received from the anodes and what proportion from the solution.

"We have to be guided to a marked degree by the results obtained.

"Speed of Rotation of Plating Barrel. This is a feature which is very important and I am sure I need not tell you that it is possible to run one of these plating barrels so fast that we would get scarcely any deposit whatever. We have frequently found it rather difficult at times to get the desired rotation, to within half revolution or so, but it should be as near 4 r. p. m. as possible, in fact 3 or 3½ is not too slow, and it may be possible to obtain fairly good results at 5 or even 6 r. p. m., but we would say this is the limit. Here is one place at least where speed does not count, even in these days when even quality is being sacrificed for excessive speed.

"We might here record the fact that we have rarely found it necessary to stir these solutions as the rotation of the plating barrel itself takes care of that point, the solutions are always well mixed.

"The selection of anodes is an important factor, we have used both cast and rolled brass, some years ago it was the general opinion among platers that to obtain a good brass deposit it was necessary to use rolled sheet brass. We must confess that we held that opinion for some time, we are not prepared to give any particular reason why we did so.

"We will relate an experience we had about fifteen years ago. We had under our supervision several still brass plating baths, of about 100 gallon capacity, and had occasion to procure a new set of anodes for one of the baths. The anodes duly arrived, they were cast brass, as ordered, at least that is what they appeared to be, and from the time they were put into use we had considerable trouble in getting a good uniform brass color, until we conceived the idea to drill a few holes in these anodes which we did, and found them to be what is known as red brass or bronze. Well, just about that time we might have been slightly prejudiced regarding cast brass anodes but can say we have fully recovered, for while at the present time we use both cast and rolled brass anodes we are free to admit that while rolled brass may give good results if properly annealed, before they are put into use this is absolutely necessary. Still, if forced to make a choice, we would select cast brass anodes.

"We hardly think it necessary to tell you here to keep all contacts clean and keep danglers on the arbor sufficiently loose so

that they keep the product in plating barrel constantly spread.

"We use neither volt meters or ammeters on these barrel platers but all are equipped with rheostats. The main conducting rods are equipped with volt meters. Occasionally we detach ammeters from one of the still plating baths and take a reading on the mechanical plating barrels. We have found that the amperage varies from 65 to 80 and about 4½ to 5 volts give the best results.

"The time required for the plating operation varies from one-half to one hour. The variety and sizes and shapes of parts which are plated in these machines are numerous and you can readily see it would take considerably longer to get a good deposit on these small nails than it would on one of these pole ends.

"*Preparations or Cleaning of Parts Before Plating.* Now these parts come to the plating department in various state of cleanliness, some are comparatively clean but a majority of them are generally covered with either oil or grease.

"In passing we would here make the observation that we have failed to notice any honest effort to diminish the quantity of this grease or oil that accumulates on the different products coming to the plating department. We are not prepared at this moment to say how far this is possible, but this fact we do know, that very often the lubrication of dies and tools used in the fabrication of these parts is often overdone.

"Now we will consider the cleaning of these pole ends. When we plated these separately they were milled in sawdust to remove the excess of oil, in fact we found all they required after this operation was a good rinsing in electric cleaning solution followed by a cold water rinse and placed in a plating barrel.

"When we decided to have these assembled before plating the cleaning operation presented an entirely different problem. You can readily see that these parts, when immersed in a cleaning solution followed by the necessary rinsing waters, that they would naturally fill up and the problem of cleaning them would be somewhat difficult; we therefore decided to employ a different method, and taking the separate parts as they come from the press we have them thoroughly milled in hardwood sawdust. They are then assembled and returned to the plating department and are placed direct in plating barrel. We might call this method dry cleaning, and in this particular case has always given good results.

"In fact, we find it necessary to employ this sawdust milling

as a factor in removing the surplus quantities of oil and grease that accumulates on the many different parts that come to the plating department.

"Now, we freely admit this method would be useless if applied to articles to be nickel plated, as we find there is still a slight film of oil remaining on the parts which would be very detrimental if they were to be plated in any acid solutions.

"But when we come to plate them in any of the cyanide solutions, especially when applied to mechanical plating barrel, the result is entirely different. The alkaline in the bath combined with continuous movement of the cylinder has the desired cleansing effect and the result is satisfactory.

"We would not recommend this method as a standard for all parts to be barrel plated, but we quite believe this method can be followed in many cases with satisfactory results.

"There are many parts we find it necessary to clean in an oblique tumbling barrel sometimes adding a quantity of soda ash and a small piece of cyanide, the operation in no way injuring the parts.

"Finishing of Product After Plating. The finishing of plated goods has always been a most important feature, and in a majority of cases a rather costly operation. This has led to the formulating of a bright brass and bright nickel solution in order that the plated article can be finished more rapidly, and in a great many cases require no finishing other than the usual drying and possibly lacquering.

"But with the advent of the steel ball mill or burnishing barrel the finishing of small parts was greatly simplified, in fact we believe they are used to a large extent at the present time for the finishing of a great variety of parts both before and after plating.

"Now, we will present for your inspection a few samples which we have placed in two groups.

"No. 1, burnished in a steel ball mill after plating and these in this group have been tumbled in oblique tumbling barrel with a small quantity of soap compound dissolved in warm water, minus the steel balls. In either case the product retains a film of the soap compound which forms a certain amount of protection to the surface.

"The manufacturers of these steel ball mills generally give directions for operating them which, if followed to a degree, will

give good results. But, there are a few points we will touch on here.

"When dissolving soap do not use water too hot, warm water will dissolve the soap. Occasionally we have found that after being in the operation for some time the steel shot will become gummed or smeared with greasy coating, and consequently will not produce a good luster. There is no stated period for this occurrence, it just breaks out occasionally and can be cured by mixing a quantity of the soap and water with a little soda ash and run with steel balls until they are thoroughly clean, and drain off the water which you will find is rather black; avoid the use of cyanide in this operation.

"Now, we come back to these pole ends once more for the reason that they present, as you see, a somewhat difficult feature. When we come to the burnishing operation it will readily be seen that they will become filled with the steel shot.

"However, when proceeding with the operation we found that all that was required was when the combined load of the steel balls and product was emptied from the burnisher into the sieves provided, that it takes the operators somewhat longer to separate the shot from the parts, this being done with the aid of a wooden paddle, and any shot remaining rattled out in drying operation which is accomplished in a revolving dryer, with hardwood sawdust heated with steam." (Applause.)

Mr. Horace Smith had come in during the reading of the above paper and assumed the Chair.

Chairman Smith: The paper of Brother Ayers is finished and I am sure there must be some discussion or some questions you want to ask.

Mr. Zadowski: I would like to know how he dries the shoe horns after he has nickel plated them.

Mr. Ayers: Hardwood sawdust drier.

Mr. Zadowski: What are you using as an abrasive on your hooks?

Mr. Ayers: Emery dust, common sweepings from an emery mill factory, when we can procure them; or sandstone.

Mr. Zadowski: Is sandstone cheaper?

Mr. Ayers: I think it is.

Mr. Sievering: I would like to ask the method of rinsing out your solution after the work is plated, particularly so in the barrel plater.

Mr. Ayers: We employ a hoister which runs on a track. It carries the mechanical plating bath, raises it out of the solution and before moving it at all the operator with gloves on slightly moves the barrel and keeps it in position until the solution drains out. It takes considerable time to drain it and the loss of solution is almost nothing. We have not found any pronounced reason why we should not do it that way. It may take a little longer to handle it, that is the main feature. When they leave the plating room they are practically done, with the exception of putting them on the poles. When we plated them separately we were continually having all kinds of trouble both in our department and the department where they were assembled, for you could not assemble them without handling them. Finger marks and stains had to be wiped off.

I didn't finish answering your question about the rinsing. When the barrel is raised out and run on a track at the end of the battery of five tanks we have another rinsing tank and the track runs around over the top of the rinsing tank and the barrels load like a rinsing tank. The barrel is loaded and then rinsed out and moved back and opened and dumped into a hopper. A pail sits underneath this hopper, a little door made with a handle on it at the bottom of it, we shove the door in and the load drops through the hopper into a pile, then placed in a burnisher. We put them in the burnisher with a little water and then we have found there must be some water, but no bad effects from it whatever.

Mr. Sievering: After that you put them in the sawdust and dry them out that way?

Mr. Ayers: From the barrel platers they go to the burnisher and when dumped from the burnisher they are put in the hot sawdust drier. It is a steam drier, it is a cast iron with a jack. It is a new tool, we have not had it in operation very long, but it is as good an operating machine as they could get for the job.

Mr. Sievering: Don't you find you lose a great many balls, or how do you eliminate your balls?

Mr. Ayers: The shot we use, while revolving in the sawdust drier, is considerable. In fact all shot I personally watch when we start the operation. We believe we were going to lose a lot of shot. It amounts to little. We separate it from the sawdust with a knife and put it back in the burnisher.

Mr. Wittig: What is the name of that?

Mr. Ayers: Maiza meal.

Mr. A. W. Seeburger (Detroit): I would like to know how you control the conditions of your bath in regard to the temperature. Of course, the zinc and copper you could tell from the color all right, but I was wondering, you did not mention anything about the temperature, how you controlled your solution.

Mr. Ayers: The temperature of the solution is always at the normal room temperature. Occasionally I take the temperature of the solutions and find they are sixty-five, around seventy. I am not prepared to state, but there might be better results if the plating bath was kept warmer than that. I am seriously thinking of having some artificial way of keeping the solutions in the still bath at a more normal temperature, because I find that most of the trouble in powder is encountered in the still plating baths. In the mechanical plating barrels it is done with very little trouble but in the still plating barrels, as I say, there is some trouble.

Mr. Seeburger: In regard to the solution, how do you control that? In accordance with the appearance of the material coming out?

Mr. Ayers: Just by the results.

Secretary Gehling: I want to say that I want to ask Mr. Ayers a question along the line of what Mr. Sievering asked. In transferring, do you do any nickel work in the barrel on ball burnishing or was all of it brass plating?

Mr. Ayers: Those shoe horns we had here are nickel plated.

Secretary Gehling: In transferring from your nickel bath and rinsing off in that one rinse of water you go immediately to your ball burnishing barrel. Doesn't your work change in appearance according to the amount of deposit you have on there? You didn't state how long you plated them, but if you gave them a short deposit of probably a half hour or twenty minutes wouldn't you have a tendency, if the barrel was well loaded, for the stuff to turn green and have a greenish scum, get a rusty look? When you got your ball furnishing things in a barrel you wouldn't be able to——(interrupted).

Mr. Ayers: You mean you couldn't transfer them to the plating barrel quickly enough?

Secretary Gehling: Rinsing in the same water all the time, the water becomes contaminated, it spoils your burnishing operations, I believe.

Mr. Ayers: The articles in the shape of shoe horns?

Secretary Gehling: Yes, they pack and are too close, you understand, to lay. They don't lay out open and are not easily rinsed, no matter how clear the water would be. What do you do in a case of that sort?

Mr. Ayers: Well, we do just as with the shoe horns if possible to do it, rig up some kind of a rack and place them in the still plating bath.

Secretary Gehling: I am speaking of barrel plating.

Mr. Ayers: I think I stated in the paper, I drew the distinction between the shoe horn and those pole ends; on account of the shape of the shoe horn, we got very poor results from nickel plating in the barrel. No matter what operation we went through we had difficulties when we attempted to plate them in the barrel plater, and I think the shape had everything to do with it.

Mr. Sievering: One more question. Do you find that the density of your solution increases as time goes on?

Mr. Ayers: Quite frequently it does.

Mr. Sievering: What do you do to overcome that?

Mr. Ayers: We found one or two of them would increase slightly and maybe one or two of them would decrease slightly. In the general toning up process on Saturday we would even them up. If we found a solution in one tank or one bath stands up two or three degrees stronger than it should or stronger than fifteen or sixteen, we take some of it out and put it in the weaker, then we get them as near equal as possible.

A WORD FROM OUR LADY ACTIVE MEMBER

Toledo Branch

Mrs. Bertha Bast (Bucyrus, O.): Mr. Chairman, Honorable Officers, Fellow-Platers and Ladies: It gives me great pleasure to have this honor at this time to address such a large assemblage of men and ladies. While I am not in the habit of making speeches and while this is very short notice, you will understand. Yet I will say this much: that the ladies are not all slow, and I think if you men interest your young lady daughters and your wives in the plating business we will have some more lady platers. I had a conversation with a couple of our young ladies here this morning, and I think if Daddy would get busy he would have some more.

I guess it seems like sort of a luxury to have such a thing as a lady plater around these days, but I will say I enjoy the work very much, and while this is my second opportunity of being at the convention I hope I will be able to take back a few new ideas, as I did at the last convention. I would like to give you a little longer talk on this matter if I had had notice previous to this, but inasmuch as our time is short and we are almost onto the dinner hour, I wish to thank you and hope we will have a very progressive meeting. (Applause.)

PHILADELPHIA BRANCH

DOINGS OF THE CHEMISTRY CLASS AT THE KENSINGTON EVENING HIGH SCHOOL

We have learned that the members of the class are most interested in how to prepare their own standard solutions and obtain the factors requisite to the analysis of the plating solutions used by themselves.

Nickel being common to all, it was selected first, each man was given a burette, a one and a 5-cc. pipette, two 250-cc. beakers and four opaque half-liter bottles.

The following C. P. chemicals were carefully weighed on an accurate balance, and dissolved in distilled water and diluted to a half liter in a 500-cc. flask, then put in their respective bottles and labeled:

Bottle No. 1—8.5 grams $Ag\ No_3$ (Silver Nitrate).

Bottle No. 2—12.5 grams Na Cn (Sodium Cyanide).
.85 grams $Ag\ No_3$ (Silver Nitrate).

Bottle No. 3—40 grams $Na_4\ P_2\ O_7$ (Sodium Pyrophosphate).

Bottle No. 4—125 grams NH_4 CL (Ammonium Chloride).

Dissolve 20.75 grams KI (Potassium Iodide) in 250 cc. of water and put in a bottle to be used as an indicator.

Dissolve 2 grams $K_2\ Cr\ O_4$ (Potassium Chromate) in 100 cc. of water and put in another bottle to be also used as an indicator.

The factor for bottle No. 1 is obtained as follows:

10.262 grams of NH_4 CL (Ammonium Chloride) are weighed and diluted to a half liter by the instructor and each man takes a 5 C C sample, which he puts in his 250 C C beaker and dilutes to 100 C C with water, then adds a drop of the Potassium Chromate indicator.

The burette is now filled with the $Ag\ No_3$ (Silver Nitrate) solution from Bottle No. 1 and adjusted to the zero mark.

To titrate let the silver nitrate solution fall from the burette drop by drop into the NH_4 CL (Ammonium Chloride) solution

prepared in the beaker until a permanent pink end point is secured.

Formula No. 1:

$$\frac{\text{Sample taken}}{\text{Number of grams of } NH_4 CL} = \text{Factor.}$$

$$\frac{}{\text{Number of C C of Ag } No_3 \text{ used (Burrette reading)}}$$

Formula No. 2:

$$\frac{\text{Grams of } NH_4 CL}{500} \times 5 = \text{number of grams in 5 C C } NH_4 CL \text{ sample.}$$

Example:

.10262 = grams of NH_4 CL in 5 c c sample

19.5 = burette reading of Ag No_3 used.

From Formula No. 1 we have:

$$\frac{.10262}{19.5} = .005263 \text{ Factor.}$$

Mark label on Bottle No. 1 N/10 Ag No_3

Factor 1 c c = .005263 grams NH_4 CL.

To find the factor for bottle No. 2 (Na Cn + Ag No_3 bottle):

20.785 grams of Ni So_4 (Nickel Sulphate) are weighed and dissolved in a 500 c c flask by the instructor and each man receives a 5 c c sample which he puts in his 250 c c beaker and adds to this:

1 cc KI (Potassium Iodide) as indicator.

50 cc $Na_4 P_2 O_7$ (Sodium Pyrophosphate) from Bottle No. 3.

20 cc NH_4 CL (Ammonium Chloride) from Bottle No. 4.

2 cc NH_4 OH (Ammonium Hydroxide).

The 50 cc burette is now filled with the Ag No_3 + Na Cn solution from Bottle No. 2 and burette adjusted to the zero mark. Titrate as before until solution in beaker is clear.

I.e., Solution in beaker will first turn milky white then slightly amber and after that clear, which will be the end point.

Formula 3:

$$\frac{\text{Grams of Ni } So_4 \text{ in sample}}{\text{Number of cc of Na Cn + Ag } No_3 \text{ Used in burette.}} = \text{Factor.}$$

Example:

.20685 grams Ni So_4 in 5 cc sample

6.7 number of cc Na Cn + Ag No_3 used from burette substitute figures in Formula No. 3.

$$\frac{.20685}{6.7} = .03072 \text{ Factor.}$$

Mark label on Bottle No. 2:

Factor 1 cc = .03072 Grams Ni So_4. (Nickel Sulphate).

How to find the Ni So_4 (Nickel Sulphate) content of a nickel bath:

With a pipette, measure a 5 cc sample of Nickel bath in a 250 cc beaker, add to this

50 cc Na_4 P_2 O_7. (Sodium Pyrophosphate), from Bottle No. 3

20 cc NH_4 CL. (Ammonium Chloride) from Bottle No. 4

1 cc KI (Potassium Iodide) as indicator.

2 cc NH_4 OH (Ammonium Hydroxide).

Fill burette with Na Cn + Ag No_3 solution from Bottle No. 2 and titrate to clear end point, as when finding factor for Bottle No. 2.

Now let:

R = burette reading
F = factor from bottle
1000 = number of cc in a liter
S = sample of solution taken
7.5 = factor to convert to ounces per gallon.

Formula 4:

$$\frac{R \times F \times 1000}{7.5 \times S} = \text{Oz/gal of Nickel Sulphate in bath}$$

Example:

R = 11.6 (burette reading)
F = .03072 (factor from Bottle No. 2)
1000 = number of cc in a liter
S = 5 cc (sample of bath)

Substitute figures in Formula 4

$$\frac{11.6 \times .03072 \times 100}{5 \times 7.5} = 9.5 \text{ Oz/gal Ni } So_4 \text{ in bath}$$

Simply multiply all the figures above the line together and divide by the product of the number below the line, the answer is ounces per gallon of Ni So_4 (Nickel Sulphate) in your solution.

To find the NH_4 CL content of a Nickel bath, take a 5 cc sample of bath in a 250 cc beaker, add to this:

100 cc water

1 cc K_2 Cr O_4 (indicator)

Fill burette with Ag No_3 solution from Bottle No. 1 and set to zero mark. Titrate to a pink end point as in titrating for factor on Bottle No. 1.

Substitute figures in Formula 4, answer will be oz/gal of NH_4 CL (Ammonium Chloride)

Let:

R = 7.45 (burette reading)

F = .005263 (factor on Bottle No. 1)

1000 = number of cc in a liter

S = 5 cc (sample of bath taken)

7.5 = factor to convert to oz/gal.

$$\frac{7.45 \times .00526 \times 1000}{5 \times 7.5} = 1.05 \text{ oz/gal } NH_4 \text{ CL (Ammonium Chloride)}$$

Three important factors to control a Nickel solution are the Nickel content, Chloride, and the PH.

The PH will be published in a later issue of the "Reminder."

ST. LOUIS BRANCH

Regular meeting of the St. Louis Branch, A. E. S., was held at Central Y. M. C. A., Friday, October 12.

Dinner was served at 6:15, after which business meeting was held with a large attendance. Keep up the good work. Those who were not there surely missed a real meeting. Lots of pep!

Dr. Stout gave us a talk on "Chromium" and told us the things that could happen in solution.

There were quite a number of questions asked, which he answered very clearly.

Dr. Stout told us of Dr. Ward losing his wife early in July. We were very sorry to hear this and our heartfelt sympathy goes out to Dr. Ward.

Dr. Stout's talk was so interesting that it grew late, and we had to bring the meeting to a close. Will continue at our next meeting, which will be held at Central Y. M. C. A. the second Friday of November.

Very truly yours, Charles T. McGinley, Secretary.

MILWAUKEE BRANCH

The Milwaukee Branch, A. E. S., held its regular monthly meeting October 11, 1928, President Pat Sheehan presiding. This was also a booster meeting, at which there were about 25 members present. Shortly after meeting, the members enjoyed themselves conversing mostly about chromium plating, and partaking lunch and refreshments.

John N. Hock, Secretary-Treasurer.

A. E. S. PAGE

Assembled Expert Scraps With and Without Significance

Election Notes

In some parts of the country in the rainy season the mud is so deep that the farmers have to jack up their cows before they can milk them.

Our Own Vaudeville

Manager—How do you like the new chef's cuisine?

Patron—I don't know, I've never ridden in it.

She—If father were to leave you a million dollars, what's the first thing you'd do?

Me—Count it.

Pitiful Cases

The man who made it his business to go to heaven and then had reverses.

You're Right

Some men would rather be dead beats than live paupers.

Advice to the Love-Worn

It always takes two people to start an argument. Her and her mother.

Deuces Wild?

$25,000,000 POKER PLANT FOR NEW ZEALAND

Government Grants Permit for Largest Project in Southern Hemisphere

—*Headlines in the New York Herald-Tribune.*

Obeyed Orders

"Prisoner, did you steal that rug?"

"No, yer Honor. A lady gave it to me and told me to beat it, and I did."—*Leatherneck.*

By the Rev. Roy. L. Smith

Your Mind Is Like—

—A room crowded with people—it needs a frequent airing.

—A highway—it soon develops ruts unless watched.

—A high powered car—it needs a steady driver.

—A garden—it will grow up to weeds if it is not watched.

—A storage battery—it needs a certain amount of recharging.

Social Accomplishments

The wealthy kleptomaniac who takes things easy.

TORONTO BRANCH

The Toronto Branch, A. E. S., held its regular monthly meeting on September 24th, at The Canadian Foresters' Hall, 22 College St., President John Walker presiding.

Mr. John Acheson, chairman of the convention committee, read a complete and final report of business transacted in connection with the convention. The members were pleased with the splendid report and proud of the committee, who, for many months, devoted much of their time to the interest of the Branch. A hearty individual vote of thanks was given to each member of the committee, after which committee was discharged.

Mr. J. Ellis, who was previously Secretary-Treasurer of the Branch, has left for California and will be missed very much by his brother members.

The event of the evening took place when the members of the Toronto Branch had an opportunity to express their thanks to Mr. Walter S. Barrows, Secretary of Convention Committee, who worked so hard and diligently, always ready with a helping hand. Mr. Barrows was taken by surprise when Mr. Acheson made the presentation of a beautiful oak desk, chair and Emeralite desk lamp, which was very appropriate, this being a token of gratitude from the members.

Mr. Chas. Kemish, Librarian, read a very interesting booklet entitled "Romance of Carborundum," which was thoroughly enjoyed by the members.

Evening class at the Central Technical School commenced on October 2nd. This is a class where members of the Branch have an opportunity to titrate their solutions and obtain a greater knowledge in the science of Electro Plating. Under the direction of our worthy instructor, Mr. J. Magill, who is also an active member of Toronto Branch.

Ques. What is the best tank for containing a 10 to 50 per cent muriatic strip for stripping Chromium?

Ans. Wooden tank (cyprus) unlined using Monel metal bolts.

Adjournment 11:30 p. m.

W. J. SUTHERLAND, Sec.-Treas.

CHICAGO BRANCH

Regular monthly meeting Chicago Branch held Saturday, October 13, at the Atlantic Hotel.

Meeting called to order, President Meyers presiding. There was a very good attendance and those members that did not attend missed a treat from two speakers.

Mr. Jacob Hay gave a very interesting talk on Chromium Plating and whenever Jake gives a talk he can put it so plain that every member gets the benefit of it and we all enjoy to hear Jake and we trust he will be back in Chicago to give us some more information.

Mr. Harold A. Faint gave a lecture on weights and measures and used the blackboard to show how to reduce and divide the measures.

Mr. Faint will, every meeting night during the time the Librarian has the question box open, start on a short course of chemistry which we know will be of great help to all. Mr. Faint is asking for all members to attend as at this time he would like to have all members of Chicago Branch attend at the beginning so as they may not miss any of the lectures. Out-of-town members, please take notice.

Chicago Branch wants to thank Mr. Faint in advance for his undertaking.

The time is again drawing near for the one great night in Chicago, that night being our annual banquet. President Meyers appointed the following members to act on the Banquet Committee:

S. E. Huenerfauth, chairman; A. E. Servis, James Hall, E. Lamoureux, C. Kocur, F. J. Hanlon, F. J. Greenwald, H. A. Gilbertson, Wm. Bott, H. Magmus.

The regular order of business being completed, the Librarian conducted the balance of the meeting and found these questions in the qustion box:

Ques. 1. What is a good formula for zinc cyanide solution?

Ans. 1. Water, 1 gal; sodium cyanide, 7 oz.; zinc cyanide, 8 oz.; sodium sulphate, 4 oz.; sodium fluoride, 1 oz.; caustic soda, 76 per cent ½ oz.; corn syrup, ½ oz.

Ques. 2. What is the best lining for tank which contains hot muriatic acid?

Ans. 2. Rubberoid paint was suggested.

Ques. 3. Give formula for nickel stripping solution using current on steel and brass.

Ans. 3. Reduce sulphurice acid to 50 or 55 degrees Be. with water and reverse current.

Ques. 4. How can aluminum be nickel plated so that it will stand buffing without peeling?

Ans. 4. Clean aluminum, dip in 2 pt. nitric acid, 1 pt. hydrofluoric acid, plate in solution with P. H. 5.2 for 5 minutes, then transfer to regular nickel solution and plate as long as desired. There will be a complete answer in our next Reviw.

Ques. 5. Is Chromium poisonous when it comes in contact with food?

Ans. 5. No.

Ques. 6. What is the best way to buff celluloid? What compound is used?

Ans. 6. Tripoli with plenty of grease. Any white composition to color.

Ques. 7. Can Chromium be plated direct on solid or block tin?

Ans. 7. It can be done.

We were sorry to hear of the death of that old timer, C. A. Burnes, who was formerly a member of Chicago Branch, A. E. S., and our sympathy is extended to his widow and family.

We are also sorry to hear of the sudden death of our member, Wm. Lotts, 5003 N. Kilbourne Ave., Chicago, and extend to his family and relatives our sincere sympathy.

S. J. C. TRAPP, Secretary.

PITTSBURGH BRANCH

Our meeting of Friday evening, October 5, held in the down town branch Y.M.C.A., was very well attended, as we had for the speaker of the evening, Mr. George B. Hogaboom, who spoke at length on "Nickel, Compositions, Control and Operations of Nickel Solutions." Mr. Hogaboom began his address by going back and giving the early history of nickel plating in all the different attempts to do the work in a successful manner, going step by step to the present day methods of control. It is the meetings of this type that every plater ought to attend, if he is to reap the benefits of the society, and we hope that all of our members will take advantage of each of our monthly meetings.

On Friday evening, November 2nd, we will have for our guest Mr. Clarence Van Derau of Mansfield, Ohio, who will speak upon "Chromium: Composition and Operation, from the Practical Viewpoint." We are making plans for a good attendance for this meeting and hope our members will appreciate what the officers are trying to bring to them. The least that they can do is to be present.

After a general discussion by those present, adjournment was taken at 11 p. m.

S. E. HEDDEN, Sec.-Treas.

CLEVELAND BRANCH

The regular monthly meeting of Cleveland Branch was held October 6, at Hotel Winton, and we had a fair attendance.

We had our librarian read the paper of Mr. McGatchee of Philadelphia Branch, after which we had a very lively discussion on plating die castings and aluminum.

Our Picnic Committee also reported and returned some of the money allowed them to spend to make things interesting and, to say the least, it was a good committee. They gave us a good time and had money left over. So you can imagine what you missed if you were not there.

H. J. TerDoest, Secretary-Treasurer.

MILWAUKEE BRANCH

The regular September education meeting of the Milwaukee Branch, A. E. S., was held at Lipp's Hall, Third and Prairie street. The subject for the evening was, "Nickel Plating of Die Castings and Aluminum."

Following is a paper read by Henry Hurtig on "The Nickel Plating of Die Castings," as the method used in the factory where he is foreman:

Paper

Ques. Mr. Shehan—Why do we have trouble throwing in recesses?
Ans. (Open for discussion).
Ques. Mr. Shehan—Why is nickel deposited before any other strike?
Ans. Mr. Hurtig—On account of zinc absorbing other metals.
Ques. Mr. Shehan—Are any of the pieces brass struck?
Ans. Mr. Hurtig—No.

Mr. Hurtig was given a rising vote of thanks for his paper.

The following paper on the Nickel Plating of Aluminum was read

by Joe Jagerman, Plating Foreman at the Aluminum Goods Company, Manitowoc.

Paper

Ques. Mr. Wittig—Have you exposed your Nickel Plated parts?

Ans. Yes, for (3) months and still looks good.

Ques. Mr. Goodsell—Do you intend to Chrome Plate parts that are nickel plated in this bath?

Ans. Yes.

Ques. Mr. Werner—Why use the acid dip before plating?

Ans. To remove oxide and deposit nickel by immersion.

Ques. Mr. Shehan—How many amps. used?

Ans. Six to ten amps. per sq. ft.

Ques. Do you get hydrogen on the cathode?

Ans. Yes, if over 3 volts are used.

Ques. Do you agitate?

Ans. No.

Mr. Jagerson was given a rising vote of thanks for his paper.

The Milwaukee Branch was honored by the presence of Mr. Elmer Drum, Research Manager of the Aluminum Goods Company of Manitowoc, Mr. Michael Mroteh, Plating Superintendent, of the Aluminum Goods Company of Manitowoc, and Mr. Arthur Olson, Factory Manager of the Racine Iron & Wire Works, Racine, Wis.

The subject for the October meeting will be "The Up-keep of Chromium Baths."

R. M. GOODSELL, Librarian.

PLATING OF DIE CASTING

Henry Hurtig, Milwaukee Branch

Castings are first roughed out with 120 emery, then greased with 180 emery and cut down with a good grade, easily cleaned tripoli polisher, keeping work as clean as possible.

Bigger casting are then wiped with a cloth so as no small lumps of tripoli remain on work, and then racked. Small castings are only racked. In racking casting, care should be taken so as not to overload rack. Die casting needs lots of room. Special racks should be designed for die casting as racks ordinarily used in plating room are not suitable for die casting. Racks for large pieces should not hold more than 3 or 4 pieces. Small casting in proportion.

The castings are then cleaned in a mild cleaner, free of caustic. If prepared cleaners are used, not more than 2 oz. of cleaner to the gallon should be used; if stronger cleaners are used, the nickel is liable to peel and blister when nickel buffed. Casting should not be in the cleaner over 45 seconds. Temperature of cleaner 170 to 190 degrees Fahr. After the castings have gone through the cleaner, they are rinsed in cold water, dipped in a 5 per cent Muriatic Acid solution, rinsed in cold water, and placed in nickel bath, electric cleaner used.

Nickel solution for die casting should be of low metal content and high conducting power. Metal content from 1.25 oz. to 1.75 oz. per gal. Solution: 10 oz. double nickel salt, table salt 2 oz., boric acid 2 oz., and ammonium sulphate 4 oz. to gallon of water. Voltage 3-5 amperes

10-20 per sq. ft., Ph. 5.6 to 5.8. Mechanical agitation should be provided.

Black streaks are caused from too low current, improper racking, poor contact or solution as to alkaline. Blisters are caused by too strong cleaner and sometimes from the practice of brass-striking before nickeling. Sometimes the casting is at fault.

Die casting should always be nickel plated before being placed in other metals.

NICKEL PLATING ALUMINUM

Jos. C. Jagerman

Sample hub cap made of 2 S. Metal which contains 99.4 per cent pf pure aluminum, the remainder consisting of iron silicon and copper.

The difficulty in plating on aluminum is as follows:

A. Presence of an oxide coating on the metal.

B. High position of aluminum in the electro-motive series.

The articles are cleaned in a mild alkaline cleaner consisting of:

A. 3 oz. Sodium carbonate
3 oz Sodium bicarbonate, heated to a temperature of 180 F. for about 10 to 15 seconds.

B. Given a cold water rinse followed by a ten-second dip in hydrofluoric acid solution consisting of:
1 part acid to 10 parts water, followed by a cold water rinse and then a 30-second dip in a nickel chloride solution
1 part of muriatic acid
3 parts water
37 oz. nickel chloride to 1 gal. of water. Followed by a cold water rinse. Then into the nickel plating solution for 40 minutes, 3 volts. The nickel plating solution ingredints are as follows:
8 oz. single nickel salts
½ oz. nickel chloride
1 oz. boracic acid
1 oz. epsom salts P. H. 6

Gratefully submitted by JOE C. JAGERMAN.

PHILADELPHIA BRANCH

Philadelphia Branch held its regular meeting, Friday, October 5,, President George Gehling presiding, with thirty-one members present.

One application was received and three applicants were elected to membership.

Mr. Albert Hirsch, librarian, gave a good talk on salt spray tests, showing samples of work tested, and drew a diagram of apparatus on the blackboard at the conclusion of his talk. After answering several questions, Mr. Hirsch was given a vote of thanks.

There was quite a discussion on the throwing power of chromium plating of small brackets, which kept those interested for some time after the meeting adjourned.

Banquet and Educational committees reported progress.

Our annual banquet will be held November 24, at the Mosebach Cafe,

Thirteenth and Girard avenue, at 7 p. m. Good speakers have been obtained to address the educational session at 3 p. m., which, as usual, will be worthwhile attending. Philip Uhl, Secretary.

WORCESTER BRANCH

The second meeting of the Worcester Branch of the American Electro-Platers' Society was held in Room 102 at the Bancroft Hotel. The meeting was called to order by President Brunell at 8:20. Each man present was called upon to introduce himself. There were seventeen present. The objects of the Society were briefly explained and applications were filled out by Defosse, Malmberg, Martin, Price, Shaughnessy, Sarkissian and Woods. Mr. Clark then took the chair and received nominations for temporary president. Mr. A. S. Brunell was nominated, seconded, and unanimously elected. He then took the chair and proceeded with the election of Mr. G. W. Jones as vice-president, R. H. Bryant as secretary-treasurer, John A. Anderson as librarian, Messrs. A. N. Garrepy, James Shaughnessy and Frank Woods as the Board of Managers, and Messrs. O. Garrepy, C. Lindgren and W. Carter as a Membership Committee. Mr. Clark then gave a brief talk on the growth and aims of the Society. Mr. Anderson spoke of some of his experiences with chromium plating and started a general discussion. The meeting adjourned at 10 p. m.

R. H. Bryant, Secretary.

ROCHESTER BRANCH

Rochester Branch held an open meeting at Powers Hotel, Friday evening, September 21, which was attended by about 150 men interested in electroplating. The meeting was opened by President Reama, who introduced President Horace H. Smith, who spoke on the benefits received by platers who are active members of the Society. He also told how the Newark Branch received so many benefits from the chemical laboratory class and how he hoped Rochester would be able to have a class soon. He then introduced Mr. Oscar J. Sizelove, also of Newark. He gave a very instructive talk on "Chromium Plating," after which a general discussion took place.

On Saturday, September 22, with Mr. Smith and Mr. Sizelove as their guests, Rochester Branch enjoyed a family outing and clambake at Rifle Range, near Rochester. Sports of all kind were enjoyed. But the feature of the day was a ball game between President Reama's and Vice-President Hart's teams. Special mention should be made of the playing of Mr. Gartland and the satisfactory work of the umpire, Mr. H. A. Todd. The game was called at 5:30 p. m., with a tie score of 3 to 3, as the bake was ready, and all enjoyed this, as it was a real old-fashioned one. The feature of the bake was a clam eating contest, the prize being a sterling silver Hickok belt buckle and belt. It was won by Mr. A. Nebuck of Buffalo, N. Y. Where Mr. Nebuck got so many clamshells from somebody knows. Rochester Branch thanks Mr. Smith and Mr. Sizelove for their kindness in coming to Rochester, and only hopes they will find time to visit us again.

Charles Griffin, Secretary.

NEWARK BRANCH

President George Wagner opened our September 21 meeting with twenty-four members present. Minutes of the previous meeting were approved as read, communications ordered filed and bills ordered paid if found correct.

The application of Mr. E. N. Taylor was read and laid over until October 5 meeting for further investigation as to whether he is eligible for active or associate membership.

The resignation of Robert Rutherford was accepted.

The subject for discussion was as follows: "What Nickel Solution Is Best to Use Prior to Chromium Plating?" Members were asked to bring an analysis of their solution.

President Wagner submitted the following analysis of a nickel solution which he is operating daily: Nickel content, 3½ oz. metallic nickel per gallon; 6.3 oz. chlorine as ammonium chloride; 5.5 cc. of ammonium hydroxide per gal.; temperature 90° F. Discussion on nickel and chromium plating was indulged in until adjournment.

Royal F. Clark, Secretary-Treasurer.

ST. LOUIS BRANCH

Regular meeting of St. Louis Branch was held at Barr Branch Library, September 14. At this meeting a motion was made to hold our meeting at the Central Y. M. C. A. on the second Friday of the month. Dinner to be served at 6:15 p. m., sharp, and meeting after dinner, which will be about 7 p. m.

In the absence of our librarian, Mr. H. J. Richards was appointed to act. He opened the discussion on chromium and nickel, and all joined in.

Dr. Stout of Washington University was present and told some of the things that he was experimenting with and would be glad to tell us the results.

Mr. Miller, our new member, was also present. Yours truly,

C. T. McGinley, Secretary.

Regular meetings will be on the second Friday until further notice. Please change in Review.

BALTIMORE-WASHINGTON BRANCH

The regular meeting of the Baltimore-Washington Branch was held October 6 at Enoch Pratt Library, Calhoun and Hollins street, Baltimore, Mr. F. F. Pierdon presiding.

It was moved and seconded that this Branch apply for a permanent charter.

Mr. Chace was our speaker for the evening, and his subject was "Lacquer." He spoke on different kinds of lacquer, or "types," of which there are three (3): One an all-gum lacquer, one an all-cotton lacquer, and one known as a combination lacquer. The all-gum lacquer is brittle and is best when used on bird cages or strong hardware. The all-cotton lacquer is a water-white lacquer, often called "silver lacquer," unsafe because it does not have pliability to give with the metals. The combination lacquer, he said, is the ideal lacquer for a jobshop, stating

for a brass bed he would use a combination lacquer that contained a whole lot of gum, and on silverware a combination which contained a lot of cotton and little gum. It was a very interesting lecture and a standing vote of thanks was given Mr. Chace at the close.

This Branch meets again Saturday, October 20, Washington Bureau of Standards. All members are requested to attend.

Two applications for membership were received and accepted.

Twelve members attended the meeting.

Geo. T. Turner, Secretary-Treasurer.

HARTFORD-CONNECTICUT VALLEY BRANCH

Hartford-Connecticut Valley Branch met on Monday evening, September 24, at the Hartford Chamber of Commerce, at 805 Main street, Hartford, Conn.

The meeting was called to order at 8:15 o'clock with President Elwin in the chair. One bill, for our per capita tax, amounting to $22.58 was ordered paid. One member was received by transfer from the New York Branch. This was Mr. A. J. Duis of 63 North First street, Meriden, Conn. One application was received, that of Mr. Fred Carlton, as an active member, from Burnside, Conn. It was voted for the application to take the usual course.

After the regular business had been transacted, Mr. W. J. R. Kennedy, of this Branch, recently elected second vice-president of the Supreme Society, gave a very interesting talk on "Chromium Plating on Tools and Gauges." The talk was enjoyed by the members and visitors present, twenty-six in all, and "Bill" was given a rising vote of thanks for his talk.

President Elwin made the evening more enjoyable by bringing a box of cigars, which were enjoyed by all present.

Mr. Frank Clark, one of our associate members, also Mr. D. U. MacDermid, gave some interesting remarks. Mr. Clark talked of the fine work done by the Junior Achievement League at Springfield, and Mr. MacDermid gave us an interesting account of his visit through some of the big plating concerns in the Middle West. Both talks were very interesting to all of us. After much discussion in regard to chromium, the meeting adjourned at 10:30 o'clock.

V. E. Grant, Secretary.

REINSTATEMENTS

	Branch
Louis Sherman, 2545 N. 32d St., Philadelphia, Pa.	Philadelphia

RESIGNATIONS

	Branch
Robert Rutherford	Newark

DEATHS

	Branch
William Lotts	Chicago

SUSPENSIONS

	Branch
E. Gunn	Newark
J. Moriarty	Newark
C. D. Easley	Philadelphia

P. Solivan ..... Philadelphia
Alfred G. Smith, Box 492, Burlington, Ont., Canada..... Toronto
Russell Giles, Box 551, N. Sydney, N. S., Canada..... Toronto
C. H. Humphries..... Indianapolis
Frank Phillips ..... Indianapolis
Al T. Smith, 16 Regina Ave., Hamilton, Canada..... Toronto

TRANSFERS Branch

A. J. Druis, from New York to..... Hartford-Connecticut Valley
H. G. Bender, from Chicago to..... Milwaukee
T. F. Slattery, from Bridgeport to..... Baltimore-Washington
Jacob Hay, from Chicago to..... Detroit

APPLICATIONS Branch

Milford H. Cohen, care of Litho Etching Corp., 1100 Brook Ave., New York City..... New York
Louis Keller, 1708 Second Ave., New York City..... New York
Charles Berlin, 108 Fulton St., New York City..... New York
Gustave Fessenmeyer ..... Cleveland
Charles F. Gross, Norristown, Pa..... Philadelphia
John D. Owens, 644 Willard St., Camden, N. J..... Philadelphia
Edward N. Taylor, 7 Patten Place, Upper Montclair, N. J..... Newark
J. Justin Busch, Room 911, Wiss Bldg., Newark, N. J..... Newark
Horace B. Watt, 139 W. 8th St., Bayonne, N. J..... Newark
Paul F. Vogelsang, 671 Broad St., Newark, N. J..... Newark
Gordon Giles, 183 Linsmore Crescent, Toronto, Ont., Canada.. Toronto
George Zimmerman, 915 Manning Ave., Toronto, Ont., Canada. Toronto
S. H. Renton, 505 Fulton Bldg., Pittsburgh, Pa..... Pittsburgh

ELECTIONS Branch

John Mueller, Jr., 620 6th Ave., Bethlehem, Pa..... Philadelphia
A. W. Hothersall, Woolwich S. E. 18, London, England.. Philadelphia
Charles F. Gross, 1323 Locust St., Norristown, Pa..... Philadelphia
Arthur W. Johnson, 318 Ashland Ave., London, Ont., Canada.. Toronto
Stanley F. Town, 23 Turner St., Merritton, Ont., Canada..... Toronto
Harry Shapiro, 2610 Park Heights Terrace, Baltimore, Md..... Washington-Baltimore
Eugene Hollis, Navy Yard, Washington, D. C... Washington-Baltimore
Geo. Mezzanotte, 545 4th St., Washington, D. C.. Washington-Baltimore
August Wm. Konder, 318 S. Louden Ave., Baltimore, Md..... Washington-Baltimore
Leo J. Schmitt, 116 Mendota St., Pittsburgh, Pa..... Pittsburgh
Charles W. Abbott, 206 Pleasant St., Dayton, Ohio..... Dayton
Dennis W. Kelly, 88 Central Ave., Roosevelt, L. I., N. Y... New York
Arthur W. Johnson, 318 Ashland Ave., London, Ont., Canada. Toronto
Stanley F. Town, 23 Turner St., Merritton, Ont., Canada..... Toronto
Jos. C. Jaggerman, 1223 S. 20th St., Manitowoc, Wis..... Milwaukee
Prof. E. F. Baker (honorary), U. of M., Ann Arbor, Mich... Milwaukee
E. H. Presser, 907 Fullerton Ave., Chicago, Ill..... Chicago
Jacob Majerski, 3146 S. Racine St., Chicago, Ill..... Chicago
F. J. Reinker, 90 N. Algona St., Dubuque, Ia..... Chicago

BOSTON

Platers' Supply Co., 202 Friend St., Boston. Secretary, A. W. Garrett, 41 King St., Dorchester, Mass.

BRIDGEPORT

Meets first and third Friday of each month at 62 Cannon St., Room 17, Bridgeport, Conn. Secretary, Wm. Ehrencrona, 872 Hancock Ave., Bridgeport, Conn.

CHICAGO

Meets second Saturday of each month, at 8 p. m., Atlantic Hotel, 816 S. Clark St. Secretary, S. J. C. Trapp, 1127 N. 7th St., Maywood, Ill.

CINCINNATI

Meets every Thursday, 7:30 p. m., at Vocational Training School, Spring and Liberty St. Secretary, Al. Yeager, 2021 Sherman Ave., Norwood, Ohio.

CLEVELAND

Meets first Saturday of each month at Hotel Winton. H. Terdoest, 414 Pioneer Ave., Akron, Ohio.

HARTFORD-CONN. VALLEY

Meets fourth Monday in each month alternately at 266 Pearl St., Hartford, Conn., and corner Broadway and Worthington St., Springfield. Secretary, Grant Vernon, 43 Putnam St., Bristol, Conn.

DAYTON

Meets first Saturday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Robert G. Suman, 2734 Ridge Road, Dayton, Ohio.

DETROIT

Meets the second Wednesday of each month at the Detroit Testing Laboratory, 554 Bagley Ave., Detroit. Secretary, Chas. Phillips, 13421 Camden Ave., Detroit, Mich.

GRAND RAPIDS

Meets on the second Saturday of each month at the Vocational High School, 129 Bostwick Ave., N. E. Secretary, Jacob Van Dyke, 1361 Union Ave., N. E., Grand Rapids, Mich.

INDIANAPOLIS

Meets the second Saturday of each month at Hotel Denison. Secretary, Louis Mertz, 1725 Union St., Indianapolis, Ind.

MILWAUKEE

Meets second and fourth Thursdays of each month at Cor. 3rd St. and Highland Ave. J. N. Hock, 1229 W. 24th St., Milwaukee, Wis.

MONTREAL

Meets last Friday of month at Office of Secretary, John H. Feelay, 411 Aylmer St., Quebec, Canada.

NEWARK

Meets first and third Fridays of each month at Franklin Hall, 41 Franklin St., Newark, N. J., at 8 p. m. Secretary-Treasurer, Royal F. Clark, P. O. Box 201, Newark, N. J.

NEW YORK

Meets every second and fourth Fridays of each month in the World Building, Park Row, New York City, N. Y. Secretary, R. J. Liquori, 2439 Hubbard St., Brooklyn, N. Y.

PHILADELPHIA

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, P. Uhl, 2432 North 29th St., Philadelphia, Pa.

PITTSBURGH

Meets first Friday of each month at 8 p. m., at downtown branch, Y. M. C. A. Secretary, S. E. Hedden, 227 Fifth St., Aspinwall, Pa.

PROVIDENCE-ATTLEBORO

Meets first and third Thursday of each month at 44 Washington St., Prov. Engineers Rooms, Providence, R. I. Secretary, J. H. Andrews, 19 Rosedale St., Providence, R. I.

ROCHESTER

Meets every third Friday of each month at the Powers Hotel. Secretary Chas. Griffin, 24 Garson Ave., Rochester, N. Y.

ST. LOUIS

Meets second Friday of each month at Central Y. M. C. A., 16th and Locust St. Secretary, C. T. McGinley, 8214 Fairham Ave, University City, Mo.

TOLEDO

Meets first Thursday of each month at Toledo Secor Hotel, corner Cherry and Page Sts. Secretary, W. W. Weiker, 2228 Middlesex Rd., Route 2, Box 635, Toledo, Ohio.

TORONTO

Meets fourth Monday of each month at Canadian Foresters' Hall, 22 College St., Room No. 2. Secretary, W. J. Sutherland, 197 Gillard Ave., Toronto, 6, Canada.

WATERBURY

Meets every second and fourth Thursday of each month. Secretary, Wm. F. Guilfoile, Garden Theatre Bldg., East Main St., Waterbury, Conn.